Notice of Allowability	Application No.	Applicant(s)	
	09/898,204	POYNOR, TODD	
	Examiner	Art Unit	
	Tuan A. Vu	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *5/17/2005*.

2. ☒ The allowed claim(s) is/are *1,2,4-10,12-14,16-19 and 21 (now renumbered 1-17)*.

3. ☒ The drawings filed on *03 July 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20050610* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. This action is responsive to the Applicant's response filed 5/9/2005.

As indicated in Applicant's response, claims 1, 3 have been amended. Claims 1-21 are pending in the office action.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Leroy Maunu, Reg. # 35,274 on 6/10/2005.

The application has been amended as follows.

In the CLAIMS, (as submitted per RCE filed 5/17/05) make following amendments:

Claim 1:

A computer-implemented method for debugging an operating system kernel executing on a server data processing system that is coupled to a network, the kernel including a debugger control component, and the server data processing system including a network interface card that implements therein a debugger network component and a protocol stack, including layers from a physical layer through an application layer, comprising:

detecting debugger messages and non-debugger messages received over the network in the protocol stack;

directing the debugger messages to the debugger network component on the network interface card;

communicating the debugger messages from the debugger network component to the debugger control component in the kernel via a shared memory interface;

communicating the non-debugger messages from the protocol stack to the kernel and bypassing the shared memory interface; and

performing debugging operations via the debugger control component in response to the debugger messages.

Claim 3: (canceled)

Claim 8:

An apparatus for debugging an operating system kernel executing on a server data processing system that is coupled to a network, the kernel including a debugger control component, and the server data processing system including a network interface card that implements therein a protocol stack, including layers from a physical layer through an application layer, and a debugger network component, comprising:

means for detecting debugger messages and non-debugger messages received over the network in the protocol stack;

means for directing the debugger messages to the debugger network component via a shared memory interface;

means for communicating the debugger messages from the debugger network component to the debugger control component in the kernel;

means for communicating the non-debugger messages from the protocol stack to the kernel and bypassing the shared memory interface; and

means for performing debugging operations via the debugger control component in response to the debugger messages.

Claim 9:

A computing arrangement for debugging an operating system kernel in a server system that is coupled to a client system via a network, comprising:

a memory configured in the server system;

a processor coupled to the memory and configured to execute an operating system kernel, the kernel including a debugger control component and a networking subsystem component, the debugger control component configured to perform debugging operations in response to debugger messages received over the network, and the networking subsystem configured to provide non-debugger messages to the kernel; and

a network interface circuit arrangement coupled to the processor and to the memory, the network interface circuit arrangement configured with a protocol stack therein and a debugger network component, the protocol stack configured to detect debugger messages and non-debugger messages received over the network and direct the debugger messages to the debugger network component, ~~and~~ the debugger network component configured to communicate the debugger messages to the debugger control component in the kernel via a shared memory interface, and the protocol stack configured to communicate the non-debugger messages from the protocol stack to the kernel and bypass the shared memory interface.

Claim 11: (canceled)

Claim 15: (canceled)

Claim 16:

A method for debugging an operating system kernel, comprising:

executing the operating system on a server data processing system that is coupled to a network, wherein the kernel includes a debugger control component and a network interface subsystem;

identifying in a protocol stack in a network interface card, debugger messages and non-debugger messages received over the network, wherein the network interface card implements a protocol stack that includes layers from ~~form~~ a physical layer through an application layer and a debugger network component coupled to the protocol stack;

transmitting debugger messages from the protocol stack to the debugger network component on the network interface card;

transmitting the debugger messages from the debugger network component to the debugger control component in the kernel via a shared memory interface;

transmitting non-debugger messages from the protocol stack to the network interface subsystem of the kernel and bypassing the shared memory interface; and

performing debugging operations via the debugger control component in response to the debugger messages.

Claim 20: (canceled)

Claim 21:

An apparatus for debugging an operating system kernel, comprising;

means for executing the operating system on a server data processing system that is coupled to a network, wherein the kernel includes a debugger control component and a network interface subsystem;

means for identifying in a protocol stack in a network interface card, debugger messages and non-debugger messages received over the network, wherein the network interface card implements a protocol stack that includes layers from a physical layer through an application layer and a debugger network component coupled to the protocol stack;

means for ~~fro~~transmitting debugger messages from the protocol stack to the debugger network component on the network interface card;

means for transmitting the debugger messages from the debugger network component to the debugger control component in the kernel via a shared memory interface;

means for transmitting non-debugger messages from the protocol stack to the network interface subsystem of the kernel and bypassing the shared memory interface; and

means for performing debugging operations via the debugger control component in response to the debugger messages.

In the SPECIFICATIONS

Amend page 7, first paragraph as follows:

filed on August 11, 2000, having application~~/patent~~ number 09/630,033, and assigned to the assignee of the present invention, now issued as US Patent No.: 6,678,746.

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

3. Claims 1-2, 4-10, 12-14, 16-19, and 21 are allowed.

The following is an examiner's statement of reasons for allowance:

The prior art taken separately or jointly does not suggest or teach the following features.

A system or method for debugging an operating system kernel on a server data processing system, (i) the server processing system including a kernel having a debugger control

component, a network interface card/circuit subsystem that implements a debugger network component and a protocol stack therein, the system or method comprising (ii) detecting debugger messages and non-debugger messages received over the network in said protocol stack, directing the debugger messages to said debugger network component, and communicating these to the debugger control component in the kernel via a shared memory interface for performing debug operations, and (iii) communicate the non-debugger messages from the protocol stack to the kernel and bypassing the shared memory interface, as recited in claims 1, 8, 9, 16, and 21.

Cardoza, USPN: 5,630,049, discloses debugging messages received by a target machine from a remote network user using a Ethernet card interface subsystem; but does not teach a protocol stack implemented inside the network interface card or subsystem to detect both debug messages for debugging the server kernel and non-debug messages received in the protocol stack therein so to allow the kernel to perform the debug operations based on debug messages communicated over using a network component and a control component as described in (i) and (ii) via a shared memory; and to communicate non-debug messages to the kernel and bypass the shared memory interface as in (iii).

Edwards, USPN 6,011,920, discloses a network interface adapter like a serial or Ethernet adapter to communicate communication protocol allowing messages from the debug host machine to debug the target machine but does not disclose debugging a kernel nor does it disclose a protocol stack implemented inside the network interface circuit or card to allow detection of debug messages and non-debug messages, to communicate debug messages via a shared memory between a network debugger component and a network control component as in

(i) and (ii), with bypassing the shared memory when non-debug messages in the protocol stack are detected as in (iii).

The use of protocol stack inside the network interface circuitry in conjunction with the shared memory between the network debugger component of the network interface circuitry and the debugger control component of the kernel as in (i) and (ii) allows specific kernel debug operations to execute in a dedicated debug memory space in parallel with but not interfering with the kernel normal operations in which the detected non-debugger messages would bypass the shared memory interface as in (iii).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (272) 272-3735. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571)272-3719.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3735 (for non-official correspondence – please consult Examiner before using) or 703-872-9306 (for official correspondence) or redirected to customer service at 571-272-3609.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VAT
June 10, 2005

KAKALI CHAKI
ORY PATENT EXAMINER
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